AMENDMENTS TO THE CLAIMS

1-44. (canceled)

45. (currently amended) A method for vascular analysis of a subject, comprising the steps of:

optically imaging moving erythrocytes within at least one optically accessible blood vessel of a subject;

determining from said optical imaging at least one flow characteristic of said erythrocytes in said at least one optically accessible blood vessel; ~~and~~

utilizing said at least one flow characteristic for identifying roughness on an inner wall of said at least one optically accessible blood vessel; and

generating an output on an output device, in response to identifying said roughness.

46. (previously presented) A method according to claim 45, wherein said at least one optically accessible blood vessel is a retinal blood vessel of the subject, and wherein optically imaging moving erythrocytes within the blood vessel comprises optically imaging moving erythrocytes within the retinal blood vessel.

47. (previously presented) A method according to claim 45, and wherein said at least one optically accessible blood vessel of the subject is a blood vessel located in tissue of an internal organ of the subject, and wherein optically imaging moving erythrocytes comprises optically imaging moving erythrocytes within the blood vessel located in the tissue.

48. (previously presented) A method according to claim 47, and wherein said tissue is selected from the group consisting of esophageal tissue, gastro-intestinal tissue, brain tissue and tissue of an internal surface of a passageway of the subject, and wherein optically imaging moving erythrocytes comprises optically imaging moving erythrocytes within the blood vessel located in the selected tissue.

49. (previously presented) A method according to claim 45, wherein said identifying comprises identifying the presence of the roughness on the inner wall of the subject's blood vessel non-invasively.

50. (previously presented) A method according to claim 45, wherein said optical imaging comprises acquiring at least two sequential images of erythrocytes in said at least one optically accessible blood vessel.

51. (previously presented) A method according to claim 45, and also comprising the step of utilizing said identifying of said roughness on said inner wall of said at least one optically accessible blood vessel in order to determine a condition of another blood vessel of the subject.

52. (previously presented) A method according to claim 45, and also comprising the step of utilizing said identifying of said roughness on said inner wall of said at least one optically accessible blood vessel in order to determine a level of arteriosclerosis in the subject.

53. (previously presented) A method according to claim 45, and wherein said at least one flow characteristic of said erythrocytes includes a flow characteristic selected from the group consisting of: mean curvature of motion lines of said erythrocytes, deviation from cylindrical symmetry of the motion lines of said erythrocytes, spatial density of local turbulences in the motion lines of said erythrocytes, and local deviations from the global character of the motion lines of said erythrocytes, and wherein determining the flow characteristic comprises determining the selected flow characteristic.

54. (currently amended) A method for vascular analysis of a subject, comprising the steps of:

(i) optically imaging moving erythrocytes within at least one optically accessible blood vessel of a subject having a first blood pressure, said first blood pressure being subject to change to a second blood pressure;

(ii) optically imaging moving erythrocytes within said at least one optically accessible blood vessel again when said first blood pressure of said subject has changed to said second blood pressure;

(iii) determining from said optical imaging of steps (i) and (ii) at least one erythrocytic flow characteristic in said at least one optically accessible blood vessel, at said first and said second blood pressure; ~~and~~

(iv) utilizing differences in said at least one flow characteristic at said first and said second blood pressure to determine a roughness index of an inner wall of said at least one optically accessible blood vessel; and

(v) generating an output on an output device, in response to determining said roughness index.

55. (previously presented) A method according to claim 54, and wherein said change from said first blood pressure to said second blood pressure includes a change caused by a cause selected from the group consisting of exercise performed by the subject, and a drug administered to the subject, and wherein step (ii) is performed when said first blood pressure has changed to said second blood pressure as a result of the selected cause.

56. (previously presented) A method according to claim 54, and wherein said first blood pressure corresponds to a first point in a cardiac cycle of the subject, wherein said second blood pressure corresponds to a second point in the cardiac cycle of the subject, and wherein steps (i) and (ii) comprise optically imaging moving erythrocytes within said at least one optically accessible blood vessel when the subject's cardiac cycle is respectively at said first and second points in the subject's cardiac cycle.

57. (canceled)

58. (previously presented) A method according to claim 56, wherein steps (i) and (ii) comprise detecting a parameter of the subject selected from the group consisting of the subject's cardiac cycle and blood pressure of the subject, and optically imaging the moving erythrocytes in response to the selected parameter.

59-65. (canceled)

66. (previously presented) A system for vascular analysis of a subject, comprising:

(i) a light source for illuminating at least one optically accessible blood vessel of the subject;

(ii) an imager for acquiring a plurality of images of moving erythrocytes showing sequential spatial distribution of said moving erythrocytes in said at least one optically accessible blood vessel;

(iii) an image discriminator for determining from said plurality of images showing sequential spatial distribution, a flow pattern of erythrocytes along said blood vessel,

(iv) a flow analyzer for analyzing said flow pattern to determine at least one flow characteristic of erythrocytes along said at least one optically accessible blood vessel of the subject; and

(v) a wall analyzer for utilizing said at least one flow characteristic for determining at least one property of an inner wall of said blood vessel.

67. (previously presented) A system according to claim 66, and wherein the wall analyzer is configured to determine a roughness of the inner wall of said blood vessel by utilizing said at least one flow characteristic.

68. (currently amended) A system according to claim 67 ~~66~~, and also comprising an arteriosclerotic index determiner for utilizing said roughness to determine a level of arteriosclerosis in said at least one optically accessible blood vessel.

69. (previously presented) A system according to claim 68, and wherein said arteriosclerotic index determiner is configured to utilize said roughness to determine an arteriosclerotic condition of another blood vessel of the subject.

70. (previously presented) A system according to claim 66, and wherein said at least one flow characteristic of said erythrocytes includes a flow characteristic selected from the group consisting of mean curvature of motion lines of said erythrocytes, deviation from cylindrical symmetry of the motion lines of said erythrocytes, spatial density of local turbulences in the motion lines of said erythrocytes, and local deviations from the global character of the motion lines of said erythrocytes, and wherein the image discriminator is configured to determine the selected flow characteristic.

71. (previously presented) A system according to claim 66, and also comprising a wavelength selector, configured to configure said imager to acquire said images of said at least one optically accessible blood vessel over a limited wavelength band.

72. (previously presented) A system according to claim 71, wherein said wavelength selector is located in an illuminating pathway between said light source and said at least one optically accessible blood vessel.

73. (previously presented) A system according to claim 71, wherein said wavelength selector is located in an imaging pathway between said at least one optically accessible blood vessel and said imager.

74. (previously presented) A system according to claim 71, and wherein said wavelength selector is configured to configure said imager to acquire said images of said at least one optically accessible blood vessel over a limited wavelength band of between 2 and 30 nanometers.

75. (previously presented) A system according to claim 66, and wherein said light source for illuminating said at least one optically accessible blood vessel of the subject is a pulsed source having a pulse to pulse interval of less than 1 second.

76. (previously presented) A system according to claim 75, and wherein said pulsed source has a pulse to pulse interval that is between 5 and 200 milliseconds.

77. (previously presented) A system according to claim 75, and wherein said pulsed source has a pulse to pulse interval that is between 5 and 40 milliseconds.

78. (previously presented) A system according to claim 66, and wherein said light source for illuminating said at least one optically accessible blood vessel of the subject is a continuous source, and said imager is configured to acquire images at predetermined intervals.

79. (previously presented) A system according to claim 66, and wherein said at least one optically accessible blood vessel of the subject is a retinal blood vessel of the subject, and wherein the light source is configured to illuminate the retinal blood vessel.

80. (previously presented) A system according to claim 66, and wherein said at least one optically accessible blood vessel of the subject is a blood vessel located in tissue of an internal organ of the subject, and wherein the light source is configured to illuminate the blood vessel located in the tissue of the internal organ.

81. (previously presented) A system according to claim 80, wherein said tissue is tissue selected from the group consisting of esophageal tissue, gastrointestinal tissue, brain tissue and tissue of an internal surface of a passageway, and wherein the light source is configured to illuminate the blood vessel located in the selected tissue.

82-88. (canceled)